ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 13 of the Commission's Rules to Update the Certification Requirements for Shipboard Radio Officers	)	RM-_____

To the Commission:

PETITION FOR RULEMAKING

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January 10, 1992

for Shipboard Radio Officers)

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SUMMARY

The American Radio Association and the Wilderness Society hereby petition the Commission to initiate a rulemaking to amend Part 13 of the Commission's Rules to update the certification requirements for shipboard Radio Officers. Because of the important role the Radio Officer plays in ensuring that critical maritime communications and navigation systems are operated and function properly, it is essential that these individuals be fully qualified in the operation, repair and maintenance of modern shipboard equipment.

The Commission currently requires only the most rudimentary knowledge of outdated equipment in order to qualify for a First or Second Class Radiotelegraph Operator Certificate. Indeed, the examination for the Radio Officer certification has not been updated since 1961 and, accordingly, fails to test knowledge of some of today's most commonplace and useful maritime communications and navigation equipment.

In order to update the qualifications for the Radio Officer Certification, the petitioners urge the Commission to take the following steps:

- Amend section 13.21 and 13.22 regarding qualifications for a First or Second Class Radiotelegraph Officer certification to specify

knowledge of "modern" maritime communications and navigation equipment, as well as familiarity with appropriate maintenance and repair techniques for these systems.

- Update the examination for the Radio Officer certification to focus on operation, repair and maintenance skills for maritime communications and navigation equipment used on today's vessels and eliminate questions regarding outdated equipment. In addition, expand and modify the question pool to prevent rote memorization of frequently asked questions.

- Stagger the dates of exams offered in different locations to facilitate pursuit of a Radio Officer certification.

- Contract with the Coast Guard's Regional Examination Centers for purposes of administering the examination to reduce the administrative burden on the Commission associated with the testing process.

- Adopt minimum training requirements -- either an associate degree in electronics engineering technology or classroom hours in appropriate subject areas -- as a prerequisite for sitting for the examination.

The petitioners believe that these modifications are essential to ensure that shipboard Radio Officers are sufficiently skilled to perform their important safety functions, and thus help to avert or minimize disaster at sea.

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To the Commission:

PETITION FOR RULEMAKING

The American Radio Association ("ARA"), by its attorneys, and the Wilderness Society hereby petition the Commission to initiate a rulemaking to amend Part 13 of its Rules to update the certification requirements for shipboard Radio Officers.[1] Specifically, the petitioners request the revision of Sections 13.21 and 13.22[2] to upgrade the qualifications for a First and Second Class Radiotelegraph Operator Certificate to require proficiency in the operation, repair and maintenance of the modern communications and related electronics equipment used on today's sea-going vessels. In conjunction with these revisions, the petitioners also urge the Commission to update its Radio Officer examination and testing process to focus on modern

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[1] Section 153(z)(1) of the Communications Act defines a radio officer on a ship of the United States as "a person holding at least a first or second class radiotelegraph operator's license as prescribed and issued by the Commission." 47 U.S.C. § 153(z)(1) (1991).

[2] 47 C.F.R. §§ 13.21 and 13.22 (1990).

communications and related electronics technology, to effect thorough testing of the applicant's proficiency in all subject areas, and to ensure ready availability of the examination to all prospective Radio Officers.

I. STATEMENT OF INTEREST

The ARA is an organization of seagoing U.S. merchant marine Radio Officers. Licensed by both the Federal Communications Commission and the U.S. Coast Guard, ARA members sail on all types of U.S.-flag vessels as the operators and maintainers of shipboard communications and related electronic equipment. Since its formation,[3] ARA has worked to establish technical and professional standards for U.S. Radio Officers in order to increase safety at sea. To promote compliance with these standards, the ARA, through its Technology Institute for Maritime Electronics ("ARA TIME"), provides training programs to upgrade the technical competence of its members, especially focusing on troubleshooting and repair of modern communications and related technology at sea and under adverse conditions. These instructional courses provide critical training for the

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[3] The ARA's predecessor organization, the American Communications Association, was founded in 1933. The ARA itself was established as a separate organization in 1948, chartered by the Congress of Industrial Organizations. In 1981, ARA became affiliated with the communications and electronics group of the International Organization of Masters, Mates and Pilots.

modern Radio Officer -- training which can avert or minimize the loss of life or environmental damage resulting from maritime disasters. However, this essential training remains optional as only the most rudimentary skills, and knowledge of outdated equipment, are tested by the Commission. The ARA has submitted this petition in an effort to upgrade the qualifications and certification requirements of all Radio Officers so they can better perform their duties and, in doing so, increase safety at sea.

The Wilderness Society is a membership organization dedicated to conservation and protection of our public lands and the associated ecosystems. The Society has joined ARA in submitting this petition because pollution resulting from sea disasters involving ocean-going vessels can affect the environment with tragic consequences. The Exxon Valdez disaster in Alaska and its damage to the Chugach National Forest and Kenai Sjords National Park is but one recent example. The Society believes that upgrading the licensing requirements for Radio Officers as requested herein can effectively help to avert or minimized further such damage in the future.

II. THE RADIO OFFICER CERTIFICATION REQUIREMENTS ARE IN DIRE NEED OF UPDATING

A. The Shipboard Radio Officer Plays a Critical Role in Ensuring Safety at Sea and Prevention of Environmental Disaster

When disaster strikes at sea, a prompt message for help can mean the difference between tragedy and rescue. The critical function of communications in saving lives and minimizing damage to the environment as a result of sea accidents requires well-maintained equipment and instant operator action -- the core functions of the shipboard Radio Officer.

Although not called upon to exercise their life-saving communications functions every voyage, the men and women who serve as Radio Officers do, in fact, enhance safety at sea each time a ship sails by ensuring that critical communications and navigation systems will function and by remaining prepared for instant action in the event of an emergency. Congress itself underscored the importance of this role by mandating in the Communications Act that all compulsory ships carry a full-time Radio Officer.[4] Indeed, in the past, the Radio Officer has proved to be the difference between tragedy and rescue in numerous accidents and near-disasters at sea:

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[4] 47 U.S.C. §§ 381-86 (1991).

- An ARA member's vessel was approaching the channel to Lake Charles, Louisiana, when a tanker nearby struck an oil rig and burst into flames. Time to abandon ship was very limited. The *Globtik Sun*'s Radio Officer sent out a radio telegraph distress call but the Coast Guard never came on the air. However, an ARA Radio Officer answered the ship's request for help and alerted the Coast Guard. Workboats in the vicinity were alerted and began picking up sailors out of the water. At daylight, a Coast Guard helicopter arrived on the scene to evacuate burned and seriously injured seamen.[5]

- The U.S.-flagged Kuwaiti tanker *Surf City* exploded killing both the mate and captain and damaging the radio telephone equipment on the bridge. The Radio Officer on board was nonetheless able to communicate the distress and alerted ships in the immediate area which sped to the rescue of the remaining crew. The Radio Officer was the last living man to leave the ship, by leaping into the burning sea, receiving burns and injuries.[6]

- The MV *Prinsendam*, in the Gulf of Alaska, suffered an engine room fire that, at its outset, melted the cables leading to the ship's state of the art communications system. The ship's Radio Officer, however, was able to use a 100 watt battery powered 500 kHz radio telegraph to contact the Coast Guard and an oil tanker in the vicinity, the *T/T Williamsburgh*. Over 300 passengers on the ship were evacuated before the ship sank.[7]

- The MV *President Truman*, with satcom equipment, was on a routine voyage from the Orient to San Pedro, California when the SATCOM HPA module failed. No spares were available onboard, nor in the next two ports of call. Into its voyage, the HF transmitter also gave out. The *President Truman*, however, never lost contact because the Radio Officer on

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[5] As relayed by the Radio Officer Bernard A. Stoller, presently an ARA Regional Representative.

[6] "Survival at Sea," Seattle Times, March 8, 1990 at F1.

[7] See Domestic News, United Press International, October 11, 1980.

> board was able to rig a device for communicating short range with the ship following behind, thereby restoring long range communications capability.[8]

Because of their essential role in averting or minimizing disaster at sea, it is imperative that Radio Officers be proficient in the operation, maintenance and repair of today's shipboard communications and related electronics equipment. The ARA has long recognized the need of Radio Officers to upgrade their skills on an ongoing basis. In 1958 the ARA in conjunction with shipowners and operators established the Technology Institute for Maritime Electronics ("ARA TIME") -- a school that would offer extensive instruction in electronics use and maintenance to ARA members on a voluntary basis. Today, ARA TIME continues to instruct Radio Officers in aspects of electronics specifically tailored to situations occurring on board a vessel at sea, including operation, troubleshooting and repair. ARA TIME offers courses in test equipment and troubleshooting techniques, solid state radar, Raytheon radar, satellite communications and SITOR/ARQ, shipboard computers, semiconductors, collision avoidance, shipboard computer repair, microprocessors, digital electronics, and gyro/auto-pilot. Under these programs, the existing skills of each participant are honed in the ARA TIME classroom,

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[8] Letter from Dave Robinson, Relief MREO MV *President Truman* to Bernard Stoller, ARA-MM&P, September 6, 1989.

instructional laboratories, and using actual shipboard equipment.[9]

Yet, despite the critical instruction offered in these programs, the skill and knowledge needed to operate and maintain the modern ship's communications center remain untested. As demonstrated below, the FCC continues to require only the most rudimentary knowledge of outdated equipment in order to qualify for a First or Second Class Radiotelegraph Operator Certificate. Given the important safety role riding on the Radio Officer's shoulders, the demonstration of more extensive and appropriate skills clearly should be required.

B. The FCC's Radio Officer Certification Requirements Have Not Kept Pace with Technological Changes and Current Safety Needs

Communications technology and the role of the Radio Officer have changed dramatically over the past few decades. Today, the shipboard Radio Officer is likely to be sitting in front of an elaborate computer terminal. Indeed, the modern vessel is a maze of complex computerized equipment.[10]

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[9] Successful completion of these courses results in certification as a Radio Electronics Officer or Master Radio Electronics Officer.

[10] Today's Radio Officer is responsible for the maintenance of electronics devices such as radars, navigation computers, Loran, satellite positioning equipment, fathometers, gyro and auto-pilot systems, weather facsimile

(continued...)

Although current long range maritime communications are made mostly over medium and high frequencies, more advanced satellite communications will eventually become the norm with the gradual phase-in of the Global Maritime Distress and Safety System (GMDSS).[11]

With the advent of this new system, the Radio Officer's role will also change. Once GMDSS is fully implemented, the Radio Officer's mandatory eight hour watch-standing requirement will not be needed.[12] As such the Radio Officer will be better able to devote efforts to troubleshooting and repair critical to the maintenance of equipment in the harsh

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[10](...continued)
receivers, bridge-to-bridge communications equipment, internal onboard communications systems, and emergency battery systems.

[11] GMDSS provides ship-to-shore communications through automated digital satellite communications. Pursuant to international agreement, voluntary implementation of GMDSS is to begin on February 1, 1992. GMDSS will be mandatory on all compulsory ships by February 1, 1999. Until that time, the current system so highly dependent on radiotelegraphy will continue to be employed on many ships. The FCC is currently in the midst of a proceeding to adopt rules to implement the new GMDSS system. See Amendment of Parts 13 and 80 of the Commission's Rules to Implement the Global Maritime Distress and Safety System (GMDSS) to Improve the Safety of Life at Sea, 5 FCC Rcd. 6212 (1990) (Notice of Proposed Rulemaking).

[12] Section 353(c) of the Communications Act, 47 U.S.C. §353, currently requires at least an eight hour watch by a Radio Officer on those ships required to meet the radiotelegraph requirements of the Act. Thus, once GMDSS becomes universal, this section of the Act may be a candidate for amendment. Unitl GMDSS has been fully implemented, however, the most reliable way of maintaining contact among ships that are GMDSS-equipped and those not so outfitted will be through 500 kHz radiotelegraph.

sea environment. Today, however, Radio Officers are frequently called upon to perform essential repairs to communications and related electronics equipment while at sea.[13] Implementation of more complex electronics systems with the advent of GMDSS and the further automation of ships will further fuel the need for skilled on-board electronics technicians.

Radio communications aboard ships has been regulated for over 80 years.[14] However, in the FCC's certification process, maritime communications remain over 30 years behind the times. To the best of the ARA's knowledge, the examination for Radio Officer certification was last reprinted in 1961. The corresponding study guide was last reprinted in 1955.[15] Clearly, maritime communications have changed significantly since that time, making both the study guide and exam outdated and archaic. Indeed, the study guide

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[13] See Exhibit A attached hereto summarizing a sample of unscheduled maintenance reports submitted to ARA by Radio Officers and Exhibit B attached hereto setting forth the radar maintenance log showing work performed by the Radio Officer who sailed aboard the S/S Tyson Lykes from 1976 to 1984.

[14] The Wireless Ship Act of 1910, Pub. Law 61-62.

[15] Pertinent pages of the 1955 study guide are attached as Appendix C. Despite the dramatic changes in equipment since its last printing, ARA's counsel has been informed by the Commission staff that this guide would still be "very helpful" in studying for a First or Second Class Radiotelegraph Operator examination today.

-- and presumably the examination[16] -- focuses substantial attention on a number of technologies that have long been abandoned for purposes of maritime communications -- among them, regenerative receivers,[17] d.c. motor generators,[18] and vacuum tube circuitry.[19] Further, the study guide completely fails to make any mention of some of today's most commonplace and useful maritime radio communications equipment or satellite communications and navigation systems. Similarly, there is no discussion of solid state electronics -- the bedrock technology of the modern communications system. Nor does the guide deal with digital electronics or communications.[20] Not surprisingly, there is absolutely no reference to GMDSS. Moreover, essential techniques for maintaining and repairing today's equipment are completely omitted. Clearly, such an outdated exam is not sufficient to ensure that all certificated individuals are in fact qualified to assume the important safety functions of a Radio Officer on today's vessel.

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[16] The examination, itself, has not been made public.

[17] See Pages 86-88 of Study Guide, attached as Appendix C.

[18] See Id. at 77-78.

[19] See Id. at 12-15, 22-23, 64-67.

[20] There are, however, references to outmoded communication modes employing baudot code for what was then high speed (60 wpm) radio teletype.

Finally, even ignoring the outdated subject matter, the exam, itself, is not an effective mechanism for testing a prospective Radio Officer's qualifications. As the exam is currently devised, a relatively small existing pool of exam questions has been utilized year after year for over 30 years. Because the questions never change, applicants are tempted simply to memorize the answers to questions identified by prior applicants, rather than truly master the subject matter.[21] Given the important safety role played by the shipboard Radio Officer, a more challenging and probative test must be devised.

III. SUGGESTED CHANGES TO THE RADIO OFFICER QUALIFICATION AND CERTIFICATION PROCEDURES

As discussed above, in order to ensure that all certificated Radio Officers possess the requisite skills to perform their important safety functions, the qualifications for this position must be updated. In particular, the petitioners submit that the required qualifications for a First or Second Class Radiotelegraph Operator Certificate, embodied in Part 13 of the Commission's Rules, need to be modified to reflect the use of modern technology and the

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[21] A number of cram courses have been set up for the radiotelephone license required of operators on ships falling within the FCC's requirement coast-wise exemption. While such a course might provide the limited knowledge needed for passing the exam, it would not impart the essential skills needed to handle an emergency situation.

revised role of today's Radio Officer. Further, the examination and testing process must be modified to assess more effectively the applicant's proficiency in these areas, and to increase the availability of the exam to all interested applicants.

A. Amendment of Part 13 of the Commission's Rules

Part 13 of the Commission's Rules sets forth the required qualifications for a First or Second Class Radiotelegraph Operator Certificate. In their current broad form, the existing elements could be read to embody proficiency in the operation of modern technology. Nevertheless, in practice, this is not the case. In order to ensure that training and the certification exam remain up-to-date, the petitioners urge the Commission to amend Section 13.21 to add the adjective "modern" to elements 1,2,3,5,6, and 8. Such a modification will ensure that prospective Radio Officers seek training on equipment currently in use and ensure that the exam will periodically be revised to reflect technological developments.

Moreover, the Radio Officer's increasingly important role in the maintenance and repair of shipboard equipment is currently not reflected in any of the existing qualifications. Accordingly, the petitioners request that Section 13.21 of the Commission's Rules be amended to add at

the end of element 6 or, alternatively as a new element (7) entitled "ship communications maintenance and repair techniques," the following:

> Specialized theory and practice applicable to the at-sea maintenance and repair of solid state electronics used in modern ship communications, including solid state communications systems, microcomputers, satellite communications systems, and collision avoidance systems.[22]

Moreover, to reflect the modern Radio Officer's practical responsibility for the maintenance and repair of the ship's navigation equipment, Sections 13.22(b)(1)(ii) and 13.22(b)(2)(ii) should also be amended to add element 8 (regarding ship radar techniques) as a mandatory part of the First and Second Class Radiotelegraph Operator exam. Questions in this area should cover collision avoidance, true motion displays, and solid state radar techniques.

B. Revisions to the First and Second Class Radiotelegraph Operator Examination and Testing Process

Similarly, the certification exam itself must be revised to assess proficiency in the operation, maintenance, and repair of the communications and related equipment in use on the modern seagoing vessel. Specifically, questions

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[22] If these skills are added as a new element 7, Sections 13.22(b)(1)(ii) and 13.22(b)(2)(ii) should be revised to add this new element to the list of required examination subject areas for First and Second Class Radiotelegraph Operator applicants.

regarding regenerative receivers, d.c. motor generators, and other outdated equipment should be eliminated from the areas of inquiry. Queries relating to more recently developed technologies, such as solid state RF systems and digital electronics, should be introduced to the exam. In addition, the examination should be designed to test skills beyond the mere operation of equipment. Indeed, given the importance of maintenance of equipment in the harsh sea environment, the test should emphasize troubleshooting and repair skills. Once the revised subject areas are established, the petitioners urge the Commission to identify them by publication as a syllabus or study guide. At a minimum, such a syllabus should provide a detailed outline of subject matters tested. The ARA would be pleased to assist the Commission in revising the areas of inquiry or devising appropriate questions.

Moreover, in order to ensure that the examination accurately assesses an applicant's proficiency in the operation, maintenance and repair of maritime communications and related electronics equipment, the petitioners urge the Commission to develop, and periodically update, a large pool of appropriate questions from which examinations can be randomly computer generated. Further, mathematical variables in particular questions should be changed periodically so that one cannot memorize an answer but must calculate the

solution to problems. Modifying the exam in this way should prevent the rote memorization of answers to questions previously asked, and encourage the in-depth study of the skills necessary for a Radio Officer to perform his important safety function.

In addition, the First and Second Class Radiotelegraph Operator testing procedure should be revised to assure applicants easier access to examinations. Currently, the First and Second Class Radiotelegraph Operator examination is normally given only during the months of February and August in limited locations. As a result, interested first-time applicants or those seeking a retest are severely restricted in terms of opportunities to pursue their chosen profession. In order to eliminate these impediments, the petitioners urge the Commission to revise the testing process in two areas. First, the Commission should stagger the dates of the exams offered in different locations. That is, the Commission should continue to offer the exam in February and August in certain cities, but make it available in April and October in others, and June and December in still others. This will provide applicants with the option of traveling to an alternative location to take the exam right away, rather than delaying their career by waiting a full six months. Moreover, this revised schedule should not augment the burden

on the FCC as it will not increase the number of times the exam is offered.

Further, in order to reduce the administrative burden on the Commission associated with the testing process, the petitioners urge the Commission to contract with the Coast Guard's 17 Regional Examination Centers ("RECs") for purposes of administering the examination. These centers are already responsible for conducting certification exams for eight of the nine officers aboard a ship. Thus, adding the Radio Officer testing to their responsibilities should not prove a drain on their resources. Moreover, as these centers were set up specifically for testing purposes, they are perhaps better equipped to perform this testing function than the FCC.[23] Accordingly, the RECs are the logical and economical choice for certification testing of Radio Officers.

Finally, the petitioners urge the Commission to adopt certain additional requirements for a First or Second Class Radiotelegraph Operator Certificate. In order to ensure that

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[23] Even the Morse code exam can be conducted at these locations without the required presence of a Morse Code expert. The code receiving portion of the exam could be accomplished by simply playing a tape of the coded message at the exam location. Similarly, the code sending test could be conducted by recording the applicant's efforts on tape and then sending the tape for evaluation to a designated examiner. This could also be accomplished using, as the telegraph key, the space bar or other keyboard key on a personal computer equipped with appropriate software now available. The exam could be graded on the spot by one proficient in code or a disc recording of the sending could be sent to the designated examiner.

a certificated Radio Officer possesses the requisite skills to fulfill his important responsibilities, an applicant should be required, prior to sitting for the examination, to have completed some minimum amount of training. Specifically, such an applicant should be required either to possess at least an associate degree in electronics engineering technology, or else to have completed classroom training in appropriate subject areas.

With regard to the classroom training, the petitioners suggest that the following subject areas and classroom hours would be sufficient to ensure the requisite proficiency:

80 hours	Semiconductors;
80 hours	Test equipment and troubleshooting;
240 hours	Integrated circuits, digital logic and microprocessors;
240 hours	Radar repair, theory and techniques; and
80 hours	GMDSS operating procedures, SITOR, SATCOM, HF/VHF communications and computer operating procedures.

The petitioners believe that the above curriculum would instill the essential proficiency needs of the modern Radio Officer. The suggested hours should be sufficient to accomplish review of the operation, maintenance and repair of today's complex maritime communications and related technology as well as hands-on training on actual or simulated equipment. Under the above proposal, the training time contemplated would approximate 64 credit hours -- commensurate with the amount needed to achieve an associate

degree in electronics engineering. Clearly, such a mandatory degree or course of study would help to ensure that one had not simply studied to pass the certification exam, but rather has gained the knowledge necessary to operate, maintain and repair the modern ship's communications and related equipment, and to perform his essential safety functions in case of an emergency.

IV. CONCLUSION

For the foregoing reasons, the petitioners urge the Commission to initiate a rulemaking to amend Part 13 of its Rules to update the certification requirements, examination, and testing procedures for shipboard Radio Officers. Updating these policies and procedures to require Radio Officers to be proficient in the operation, maintenance and repair of the modern communications and related electronics

equipment used on today's seagoing vessels is essential to prevent, or at least minimize, disaster at sea.

Respectfully submitted,

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